

Fuses Made Simple™ - Control Circuits

The easiest and
fastest way to select
and specify the right
control circuit fuse

Bussmann
by **EATON**

Fuses Made Simple™ - Control Circuits

Bussmann's Fuses Made Simple program provides the easiest and fastest way to select and specify the right fuse. Whether it's branch circuit or control circuit (supplemental) fuses, we take the guesswork out of selecting the right fuse. What's more, we make it simple to replace fuses with six color groups (categorized by voltage rating)--all while enhancing the safety of the electrical system.

Find the control circuit fuse you need in three simple steps:

- 1 TYPE** Select the fuse type. Select from time-delay (for inductive loads) or fast-acting (for resistive loads).
- 2 VOLTAGE** Select the voltage rating needed. Keep in mind that fuse voltage rating must be equal to or greater than the circuit voltage.
- 3 INTERRUPTING RATING** Verify that the interrupting rating of the fuse selected is sufficient for the circuit application. Keep in mind that the interrupting rating must be equal to or greater than the available short-circuit current.

Use the following table to find and select the right control circuit fuse:

	600Vac	500Vac	250Vac	125Vac	48Vac	32Vac
TIME-DELAY	Low-Peak™ Class CC (LP-CC) fuse recommended*	FNQ 10kA (1/4 - 30 Amp)	FNM 35A (1/4 - 1 Amp) 100A (1 1/2 - 3 1/2 Amp) 200A (4 - 10 Amp) 10kA (12 - 30 Amp) FNA² 35A (1/4 - 3/4 Amp) 200A (1 - 6 Amp)	FNA² 10kA (6 1/4 - 15 Amp)	Upgrade to 125Vac	FNA² 1kA (20 - 30 Amp)
	KTK 100kA (1/4 - 30 Amp) KLM³ 100kA (1/4 - 30 Amp) BBS¹ 10kA (1/4 - 6 Amp)	Upgrade up to 600Vac	BAF 35A (1/4 - 1 Amp) MIC² 35A (1 Amp) 100A (1 1/2 - 3 Amp) 200A (4 - 10 Amp) 750A (12 - 15 Amp) 200A (20 - 30 Amp) BBS¹ 10kA (7 - 10 Amp)	Upgrade to 250Vac	BBS¹ kA ^{**} (12 - 30 Amp)	MIC² 10kA (20 - 30 Amp)

¹Fuse is 1 1/4" long ²Fuse is pin indicating ³Fuse is also rated for 600Vdc, 50kA interrupting rating
 *For primary protection of control transformers, use FNQ-R. **For interrupting rating, contact factory.

For ultimate protection, any of the control circuit fuses above can be upgraded to a branch circuit rated Low-Peak Class CC fuse (LP-CC).*

*For primary protection of control transformers, use FNQ-R.

Importance of voltage rating and interrupting rating

Control circuit fuses have many different voltage ratings, ranging from 32Vac to 600Vac, and interrupting ratings up to 100kA. Because their physical size does not vary with voltage or interrupting ratings, the most frequent cause of misapplication is due to improper voltage or interrupting rating selection. This leads to compromised system integrity, and equipment and personnel safety. It is important to note, though, that when a fuse is applied beyond its ratings, there may not be any initial indicators. Adverse consequences typically result when a system fault occurs and an improperly sized fuse attempts to interrupt an overcurrent event.

VOLTAGE RATING

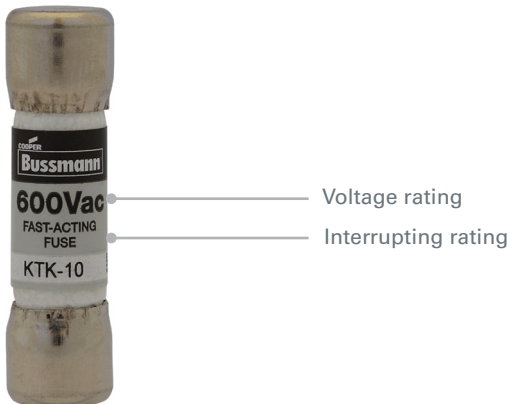
Voltage rating is extremely important. The proper application of an overcurrent protective device, according to its voltage rating, requires that the voltage rating of the device be equal to or greater than the system voltage. It can be higher but not lower. For instance, a 600V fuse can be used to safely protect a 208V circuit. However, when an overcurrent protective device is applied beyond its rating, there may be potential for fire and arcing energy, which poses a severe fire risk to other components in the panel.

INTERRUPTING RATING

Interrupting rating is also of critical importance. An overcurrent protective device must be able to withstand the destructive energy of short-circuit currents of the equipment it is protecting. If a fault current exceeds a level beyond the capacity of the protective device, the device may actually rupture, causing additional damage. It is therefore important when applying a fuse to use one that can sustain the largest potential short-circuit currents. Failure to apply fuses with the appropriate interrupting rating can be a serious safety hazard.

Fuses Made Simple™ - Control Circuits helps enhance safety

Bussmann's Fuses Made Simple - Control Circuits helps minimize the risk of misapplication by clearly and consistently indicating both the voltage rating and interrupting rating on the fuse label. The voltage rating is easily identified by both the color code band and the large print on the fuse label. Additionally, the interrupting rating is printed on the side of each fuse.









Easy Selection by Application

Application*	Fast-Acting					Time-Delay		
	KTK	BAF	BBS	KLM	MIC	FNQ	FNA	FNM
1 General purpose, non-inductive loads	✓	✓	✓		✓			
2 277V lighting circuits	✓	✓				✓		✓
3 Meter circuits	✓	✓	✓			✓		✓
4 Any non-inductive load 600Vac and less	✓							
5 Any non-inductive load 250Vac and less	✓	✓						
6 DC control circuits up to 600Vdc				✓				
7 480V primary control transformer protection						✓		
8 DC control circuits requiring fast-acting fuses	✓			✓				
9 Lighting circuit protection	✓	✓				✓		✓
10 250V and less secondary control transformer protection						✓		✓
11 Lighting ballasts			✓			✓		✓
12 PLC circuits	✓		✓		✓		✓	
13 Electronic circuits	✓		✓		✓		✓	
14 Control circuits	✓		✓		✓		✓	
15 Solenoids (coils)						✓	✓	✓
16 Power supply	✓			✓		✓		
17 Appliances	✓	✓	✓			✓		
18 Flexible and extension cords	✓	✓				✓		
19 Control relay						✓		
20 Photovoltaic source circuits				✓				
21 Motor control circuits	✓					✓		✓
22 Auxiliary and signal contacts	✓							
23 Amplifier protection						✓		✓
24 Contactors						✓		✓
25 Testing equipment (meters)	✓		✓	✓				✓
26 Receptacles	✓					✓		✓

*Applied in circuits already properly protected by a branch circuit overcurrent protective device or when recognized by the NEC® to provide equivalent branch circuit overcurrent protection.

Color-coded by voltage

Each fuse label has a unique identifying color band that represents the fuse's maximum voltage rating. When it's time to replace a fuse, Bussmann makes it easy to search for the replacement. Select the voltage needed by simply looking for the Bussmann fuse with the right color band in the storage bin. This narrows the search and speeds replacement time.

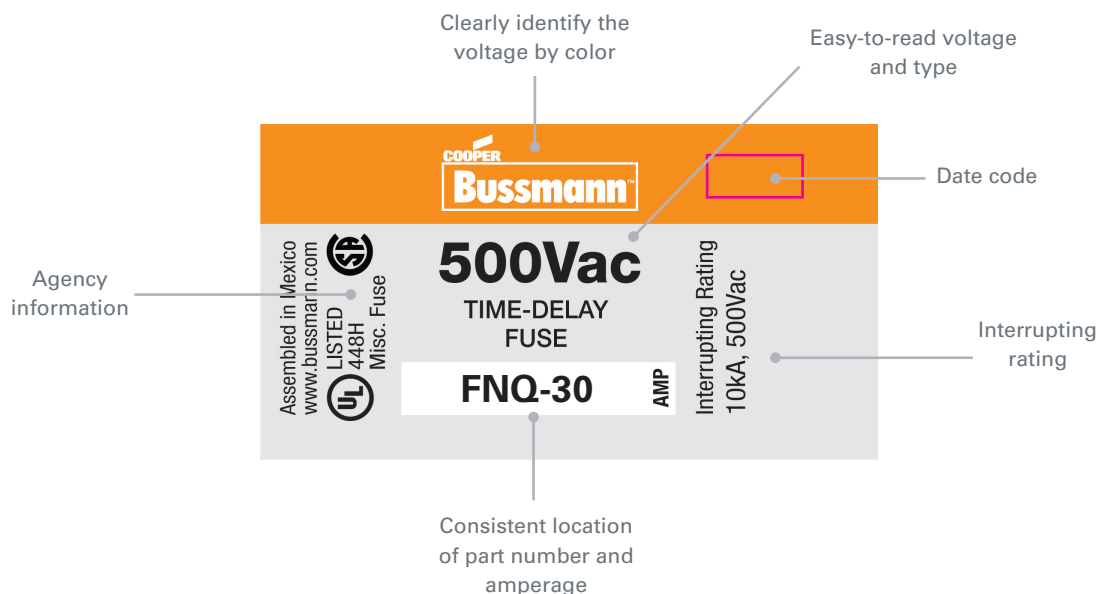
<p>600Vac</p>  <p>KTK KLM³ BBS¹</p>	<p>500Vac</p>  <p>FNQ</p>	<p>250Vac</p>  <p>FNM FNA² BAF BBS¹ MIC²</p>
<p>125Vac</p>  <p>FNA²</p>	<p>48Vac</p>  <p>BBS¹</p>	<p>32Vac</p>  <p>FNA² MIC²</p>

Notes:

- ¹ Fuse is 13/8" long
- ² Fuse is pin indicating
- ³ Fuse is also rated for 600Vdc

Consistent look for each label

Every fuse label now has a consistent look. Critical fuse information is presented in an easy-to-read format across the entire Bussmann control circuit fuse portfolio to help speed replacement.



Complementary Products

In addition to supplemental control circuit fuses, Bussmann offers a broad portfolio of circuit protection solutions. Visit www.bussmann.com to learn more.

Additional fuse portfolio



Fuses Made Simple™
UL low voltage



Class CF time-delay and fast-acting CUBEFuse UL fuses



High speed fuses



Electronic and small dimension fuses

Fuse holders, blocks, and power distribution blocks



Power distribution fuse blocks



Modular knifeblade fuse blocks



Finger-safe power distribution blocks



Compact modular fuse holders

Disconnect switches and safety switches



CUBEFuse Compact Circuit Protector (CCP_CF)



Class CC and midget Compact Circuit Protector (CCP)



Fused rotary disconnect switch



Non-fused rotary disconnect switch

Surge protective devices



Type 1 SurgePOD™
HEAVY DUTY



Type 2 DIN-Rail SPDs



DIN-Rail data signal SPDs

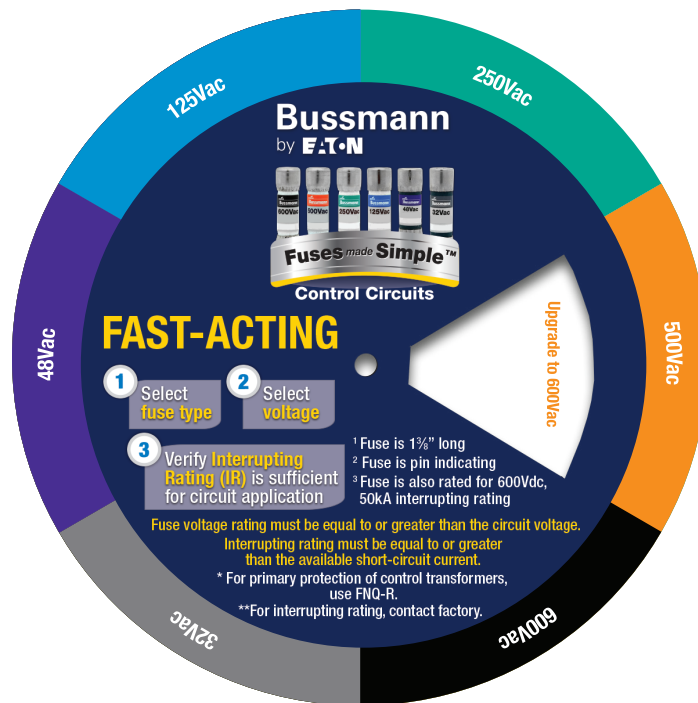


BNC coaxial cable data signal SPDs

Fuses Made Simple™ - Control Circuits is the easiest and fastest way to select and specify the right control circuit fuse. In just three simple steps, you can find the control fuse you need.

- 1 TYPE** Select the fuse type. Select from time-delay (for inductive loads) or fast-acting (for resistive loads).
- 2 VOLTAGE** Select the voltage rating needed. Keep in mind that fuse voltage rating must be equal to or greater than the circuit voltage.
- 3 INTERRUPTING RATING** Verify that the interrupting rating of the fuse selected is sufficient for the circuit application. Keep in mind that the interrupting rating must be equal to or greater than the available short-circuit current.

Use the chart at the beginning of this document to go through the three steps and select the control fuse you need. Or, you can use the selection wheel attached below. Just remove it from this page and take it with you (it's small enough to fit in a pocket). Now the selection of the right control fuse is at your fingertips. Visit www.cooperbussmann.com/FMSSC to learn more.



Customer Assistance

Customer Satisfaction Team

Available to answer questions regarding Bussmann products & services Monday-Friday, 7:00 a.m. – 6:00 p.m. Central Time. Contact:

- Toll-free phone: 855-287-7626 (855-BUSSMANN)
- Toll-free fax: 800-544-2570
- E-mail: busscustsat@eaton.com

Emergency and After-Hours Orders

Next flight out or will call shipment for time-critical needs. Customers pay only standard product price, rush freight charges, & modest emergency service fee. Place these orders through the Customer Satisfaction Team during regular business hours. For after-hours, contact:

- After hours 314-995-1342

C3 – the Enhanced, Online Cooper Customer Center

Provides real time product availability, net pricing, order status & shipment tracking for: B-Line, Bussmann, Crouse-Hinds, Lighting, Power Systems & Wiring Devices. Call 877-995-5955 for log-in assistance. Available at:

- www.cooperc3.com

Application Engineering

Technical assistance is available to all customers. Application support is available Monday-Friday, 7:00 a.m. – 5:00 p.m. Central Time. Contact:

- Toll-free phone: 855-287-7626 (855-BUSSMANN)
- E-mail: fusetech@eaton.com

Online Resources

Visit www.bussmann.com for the following resources:

- Product search & cross-reference
- Product & technical materials
- Solutions centers for information on topical issues including arc flash, selective coordination & short-circuit current rating
- Technical tools, like our arc flash calculator
- Where to purchase Bussmann product

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Your authorized distributor is:



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